1. (Currently Amended) An isolated and purified nucleic acid molecule which encodes all or part of an *E. coli* flagellin protein, the molecule being capable of identifying the H serotype of an *E. coli* when hybridised to a gene of the *E. coli* which encodes a flagellin protein, provided that the molecule does not encode a flagellin protein expressed by the *E. coli* H1, H7, H12 or H48 type strains.

2. (Original) A nucleic acid molecule according to claim 1 wherein the molecule is derived from a *fliC* gene.

3. (Original) A nucleic acid molecule according to claim 1 including all or part of a sequence according to any one of SEQ ID NOs:1 to 68.

4. (Original) A nucleic acid molecule according to claim 1 consisting of all or part of a sequence according to any one of SEQ ID NOs: 1 to 68.

5. (Original) A nucleic acid molecule according to claim 4 wherein the molecule is from about 10 to 20 nucleotides in length.

6. (Currently Amended) A primer selected from

| SEQ ID NO: | H specificity | Positions of primer 1 | Positions of primer 2 |
|---|---|---|---|
| 66 | 1 | 892-909 | 1172-1189 |
| 67 | 2 | 568-587 | 1039-1056 |
| 6,17,42 | 4 | 466-483 | 628-648 |

| | | | |
|---|---|---|---|
| 7 | 5 | 697-714 | 877-897 |
| 8 | 6 | 565-585 | 799-816 |
| 9 | 7 | 553-570 | 1483-1500 |
| 11 | 9 | 616-633 | 838-855 |
| 12(49) | 10 | 559-579 | 697-717 |
| 13 | 11 | 586-606 | 791-810 |
| 14 | 12 | 892-909 | 1172-1189 |
| 15 | 14 | 586-606 | 793-813 |
| 16 | 15 | 640-660 | 817-834 |
| 68 | 16 | 649-666 | 925-942 |
| 18 | 18 | 589-606 | 802-819 |
| 17 | 19 | 607-624 | 538-855 |
| 20 | 20 | 574-591 | 760-780 |
| 21,46 | 21 | 676-693 | 862-879 |
| 22 | 23 | 637-654 | 1336-1353 |
| 23 | 24 | 496-516 | 772-792 |
| 25 | 26 | 553-570 | 772-789 |
| 26 | 27 | 685-702 | 799-819 |
| 27 | 28 | 592-609 | 778-798 |
| 28 | 29 | 538-555 | 757-774 |
| 29 | 30 | 814-831 | 943-962 |
| 30 | 31 | 571-588 | 790-807 |
| 31 | 32 | 514-831 | 1057-1074 |
| 32 | 33 | 553-570 | 718-735 |
| 33 | 34 | 568-585 | 796-816 |
| 36,53 | 38 | 553-573 | 709-729 |
| 37 | 39 | 556-573 | 718-735 |
| 39 | 41 | 598-615 | 784-801 |
| 40 | 42 | 547-567 | 715-735 |
| 41 | 43 | 580-597 | 844-861 |
| 43 | 45 | 640-657 | 943-963 |
| 44 | 46 | 565-582 | 781-801 |
| 48 | 49 | 589-609 | 754-771 |
| 50 | 51 | 565-582 | 1042-1059 |
| 51 | 52 | 598-615 | 829-846 |
| 54 | 56 | 697-714 | 877-897 |
| 10 and 38 | | 562-579 | 1045-1062 |
| 24 | | 529-549 | 703-723 |
| 34 | | 769-789 | 1045-1065 |
| 35 | | 520-537 | 715-735 |
| 47 | | 568-585 | 835-852 |
| 52 | | 988-1008 | 1344-1364 |

the group of primers shown in the Table ~~3~~ above.

7. (Original) A method of detecting the H serotype of *E. coli* in a sample, the method comprising the following steps:

(a) contacting a gene of an *E. coli* in the sample with a nucleic acid molecule according to claim 1 in conditions sufficient to allow the nucleic acid molecule to hybridise to the gene; and

(b) detecting a nucleic acid molecule which is hybridised to the gene, to detect the H serotype of the *E. coli* in the sample.

8. (Original) A method according to claim 7 wherein the hybridised nucleic acid molecules are detected by Southern Blot analysis.

9. (Original) A method of detecting the H serotype of *E. coli* in a sample, the method comprising the following steps:

(a) contacting a gene of an *E. coli* in the sample with a pair of nucleic acid molecules according to claim 1 in conditions sufficient to allow the pair of nucleic acid molecules to hybridise to the gene; and

(b) detecting a pair of nucleic acid molecules which is hybridised to the gene, to detect the H serotype of the *E. coli* in the sample.

10. (Original) A method according to claim 9 wherein the hybridised pairs of nucleic acid molecules are detected by the polymerase chain reaction.

11. (Original) A method for detecting the H and O serotype of *E. coli* in a sample, the method comprising the following steps:

(a) contacting a gene of the *E. coli* with a nucleic acid molecule derived from a gene encoding a transferase or a gene encoding an enzyme for the transport or processing of a polysaccharide or oligosaccharide unit, the gene being involved in the synthesis of a *E. coli* O antigen, in conditions sufficient to allow the nucleic acid molecule to hybridise to the gene;

(b) contacting a gene of an *E. coli* in the sample with a nucleic acid molecule according to claim 1 in conditions sufficient to allow the nucleic acid molecule to hybridise to the gene; and

(c) detecting nucleic acid molecules which are hybridised to the genes, to detect the H and O serotype of the *E. coli* in the sample.

12. (Currently Amended) A method according to claim 11 wherein the nucleic acid molecule of step (a) is selected from the group consisting of:

*wbdH* (nucleotide position 739 to 1932 of SEQ ID NO:45~~Figure 5~~),

*wzx* (nucleotide position 8646 to 9911 of SEQ ID NO:45~~Figure 5~~),

*wzy* (nucleotide position 9901 to 10953 of SEQ ID NO:45~~Figure 5~~),

*wbdM* (nucleotide position 11821 to 12945 of SEQ ID NO:45~~Figure 5~~),

*wbdN* (nucleotide position 79 to 861 of SEQ ID NO:56~~Figure 6~~),

*wbdO* (nucleotide position 2011 to 2757 of SEQ ID NO:56~~Figure 6~~),

*wbdP* (nucleotide position 5257 to 6471 of SEQ ID NO:56~~Figure 6~~),

*wbdR* (nucleotide position 13156 to 13821 of SEQ ID NO:56~~Figure 6~~),

*wzx* (nucleotide position 2744 to 4135 of SEQ ID NO:56~~Figure 6~~) and

*wzy* (nucleotide position 858 to 2042 of SEQ ID NO:56~~Figure 6~~).

13. (Presently Amended) A method according to claim 12 wherein the nucleic acid molecule of step (a) is a primer selected from

| Forward primer (base position of SEQ ID NO:1) | Reverse Primer (base position of SEQ ID NO:1) |
|---|---|
| 739-757 | 1941-1924 |
| 925-942 | 1731-1714 |
| 925-942 | 1347-1330 |
| 1165-1182 | 1731-1714 |
| 8646-8663 | 9908-9891 |
| 8906-8923 | 9468-9451 |
| 9150-9167 | 9754-9737 |
| 9976-9996 | 10827-10807 |
| 10113-10130 | 10484-10467 |
| 10931-10949 | 11824-11796 |
| 11821-11844 | 12945-12924 |
| 12042-12059 | 12447-12430 |
| 12258-12275 | 12698-12681 |

| Forward primer (base position of SEQ ID NO:2) | Reverse Primer (base position of SEQ ID NO:2) |
|---|---|
| 79-96 | 861-844 |
| 184-201 | 531-514 |
| 310-327 | 768-751 |
| 858-875 | 2042-2025 |
| 1053-1070 | 1619-1602 |
| 1278-1295 | 1913-1896 |
| 2011-2028 | 2757-2740 |
| 2110-2127 | 2493-2476 |
| 2305-2322 | 2682-2665 |
| 2744-2761 | 4135-4118 |
| 2942-2959 | 3628-3611 |
| 5257-5274 | 6471-6454 |
| 5440-5457 | 5973-5956 |
| 5707-5724 | 6231-6214 |
| 13261-13278 | 13629-13612 |
| 13384-13401 | 13731-13714 |

the group of primers shown in the Tables ~~8, 8A, 9 and 9A~~ above.

14. (Original) A method according to claim 11 wherein the hybridised nucleic acid molecules are detected by Southern Blot analysis.

15. (Original) A method for detecting the H and O serotype of *E. coli* in a sample, the method comprising the following steps:

(a) contacting a gene of the *E. coli* with a pair of nucleic acid molecules derived from a gene encoding a transferase or a gene encoding an enzyme for the transport or processing of a polysaccharide or oligosaccharide unit, the gene being involved in the synthesis of a *E. coli* O antigen, in conditions sufficient to allow the pair of nucleic acid molecules to hybridise to the gene;

(b) contacting a gene of an *E. coli* in the sample with a pair of nucleic acid molecules according to claim 1 in conditions sufficient to allow the pair of nucleic acid molecules to hybridise to the gene; and

(c) detecting pairs of nucleic acid molecules which are hybridised to the genes, to detect the H and O serotype of the *E. coli* in the sample.

16. (Currently Amended) A method according to claim 15 wherein the pair of nucleic acid molecules of step (a) is selected from the group consisting of:

*wbdH* (nucleotide position 739 to 1932 of SEQ ID NO:45~~Figure 5~~),

*wzx* (nucleotide position 8646 to 9911 of SEQ ID NO:45~~Figure 5~~),

*wzy* (nucleotide position 9901 to 10953 of SEQ ID NO:45~~Figure 5~~),

*wbdM* (nucleotide position 11821 to 12945 of SEQ ID NO:45~~Figure 5~~),

*wbdN* (nucleotide position 79 to 861 of SEQ ID NO:56~~Figure 6~~),

*wbdO* (nucleotide position 2011 to 2757 of SEQ ID NO:56~~Figure 6~~),

*wbdP* (nucleotide position 5257 to 6471 of SEQ ID NO:56~~Figure 6~~),

*wbdR* (nucleotide position 13156 to 13821 of SEQ ID NO:56~~Figure 6~~),

*wzx* (nucleotide position 2744 to 4135 of SEQ ID NO:56~~Figure 6~~) and

*wzy* (nucleotide position 858 to 2042 of SEQ ID NO:56~~Figure 6~~).

17. (Presently Amended) A method according to claim 15 wherein the nucleic acid molecules of the pair of step (a) are primers selected from

| Forward primer (base position of SEQ ID NO:1) | Reverse Primer (base position of SEQ ID NO:1) |
|---|---|
| 739-757 | 1941-1924 |
| 925-942 | 1731-1714 |
| 925-942 | 1347-1330 |
| 1165-1182 | 1731-1714 |
| 8646-8663 | 9908-9891 |
| 8906-8923 | 9468-9451 |
| 9150-9167 | 9754-9737 |
| 9976-9996 | 10827-10807 |
| 10113-10130 | 10484-10467 |
| 10931-10949 | 11824-11796 |
| 11821-11844 | 12945-12924 |
| 12042-12059 | 12447-12430 |
| 12258-12275 | 12698-12681 |

| Forward primer | Reverse Primer |
|---|---|

| (base position of SEQ ID NO:2) | (base position of SEQ ID NO:2) |
|---|---|
| 79-96 | 861-844 |
| 184-201 | 531-514 |
| 310-327 | 768-751 |
| 858-875 | 2042-2025 |
| 1053-1070 | 1619-1602 |
| 1278-1295 | 1913-1896 |
| 2011-2028 | 2757-2740 |
| 2110-2127 | 2493-2476 |
| 2305-2322 | 2682-2665 |
| 2744-2761 | 4135-4118 |
| 2942-2959 | 3628-3611 |
| 5257-5274 | 6471-6454 |
| 5440-5457 | 5973-5956 |
| 5707-5724 | 6231-6214 |
| 13261-13278 | 13629-13612 |
| 13384-13401 | 13731-13714 |

the group of primers shown in the Tables ~~8, 8A, 9 and 9A~~ above.

18. (Original) A method according to claim 15 wherein the hybridised pairs of nucleic acid molecules are detected by the polymerase chain reaction.

19. (Original) A method for detecting the H and O serotype of *E. coli* in a sample, the method comprising the following steps:

(a) contacting a gene of an E. coli in the sample with a nucleic acid molecule according to claim 1, in conditions sufficient to allow the nucleic acid molecule to hybridise to the gene; and

(b) detecting a nucleic acid molecule which is hybridised to the gene, to detect the H and O serotype of *E. coli* in the sample.

20. (Original) A method according to claim 19 wherein the nucleic acid molecule is according to any one of SEQ ID NOS: 9, 55, 57 to 65.

21. (Previously Amended) A method according to claim 7 wherein the sample is selected from the group consisting of a sample derived from food, a sample derived from faeces and a sample derived from a patient or animal.

22. (Previously Amended) A kit for identifying the H serotype of *E. coli*, the kit comprising at least one nucleic acid molecule according to claim 1.

23. (Currently Amended) A kit for identifying the H and O serotype of *E. coli*, the kit comprising:

(a) at least one isolated and purified nucleic acid molecule according to claim 1; and

(b) at least one nucleic acid molecule derived from and specific for a gene encoding a transferase or a gene encoding an enzyme for the transport or processing of a polysaccharide or oligosaccharide unit, the gene being involved in the synthesis of a particular *E. coli* O antigen.

24. (Currently Amended) A kit according to claim 23 wherein the at least one nucleic acid molecule of (b~~a~~) is selected from the group consisting of:

*wbdH* (nucleotide position 739 to 1932 of SEQ ID NO:45~~Figure 5~~),

*wzx* (nucleotide position 8646 to 9911 of SEQ ID NO:45~~Figure 5~~),

*wzy* (nucleotide position 9901 to 10953 of SEQ ID NO:45~~Figure 5~~),

*wbdM* (nucleotide position 11821 to 12945 of SEQ ID NO:45~~Figure 5~~),

*wbdN* (nucleotide position 79 to 861 of SEQ ID NO:56~~Figure 6~~),

*wbdO* (nucleotide position 2011 to 2757 of SEQ ID NO:56~~Figure 6~~),

*wbdP* (nucleotide position 5257 to 6471 of SEQ ID NO:56~~Figure 6~~),

*wbdR* (nucleotide position 13156 to 13821 of SEQ ID NO:56~~Figure 6~~),

*wzx* (nucleotide position 2744 to 4135 of SEQ ID NO:56~~Figure 6~~) and

*wzy* (nucleotide position 858 to 2042 of SEQ ID NO:56~~Figure 6~~).

25. (Presently Amended) A kit according to claim 24 wherein the nucleic acid molecule of (b~~a~~) is a primer selected from

| Forward primer (base position of SEQ ID NO:1) | Reverse Primer (base position of SEQ ID NO:1) |
|---|---|
| 739-757 | 1941-1924 |
| 925-942 | 1731-1714 |
| 925-942 | 1347-1330 |
| 1165-1182 | 1731-1714 |
| 8646-8663 | 9908-9891 |
| 8906-8923 | 9468-9451 |
| 9150-9167 | 9754-9737 |
| 9976-9996 | 10827-10807 |
| 10113-10130 | 10484-10467 |
| 10931-10949 | 11824-11796 |
| 11821-11844 | 12945-12924 |
| 12042-12059 | 12447-12430 |

| 12258-12275 | 12698-12681 |
|---|---|

| Forward primer (base position of SEQ ID NO:2) | Reverse Primer (base position of SEQ ID NO:2) |
|---|---|
| 79-96 | 861-844 |
| 184-201 | 531-514 |
| 310-327 | 768-751 |
| 858-875 | 2042-2025 |
| 1053-1070 | 1619-1602 |
| 1278-1295 | 1913-1896 |
| 2011-2028 | 2757-2740 |
| 2110-2127 | 2493-2476 |
| 2305-2322 | 2682-2665 |
| 2744-2761 | 4135-4118 |
| 2942-2959 | 3628-3611 |
| 5257-5274 | 6471-6454 |
| 5440-5457 | 5973-5956 |
| 5707-5724 | 6231-6214 |
| 13261-13278 | 13629-13612 |
| 13384-13401 | 13731-13714 |

the group of primers shown in the Tables ~~8, 8A, 9 and 9A~~ above.

26. (Previously Added) A method according to claim 9 wherein the sample is selected from the group consisting of a sample derived from food, a sample derived from faeces and a sample derived from a patient or animal.

27. (Previously Added) A method according to claim 11 wherein the sample is selected from the group consisting of a sample derived from food, a sample derived from faeces and a sample derived from a patient or animal.

28. (Previously Added) A method according to claim 15 wherein the sample is selected from the group consisting of a

sample derived from food, a sample derived from faeces and a sample derived from a patient or animal.

29. (Previously Added) A method according to claim 19 wherein the sample is selected from the group consisting of a sample derived from food, a sample derived from faeces and a sample derived from a patient or animal.

30. (Previously Added) A kit for identifying the H serotype of *E. coli*, the kit comprising at least one nucleic acid molecule according to claim 6.

31. (Previously Added) A kit for identifying the H and O serotype of *E. coli*, the kit comprising:

(a) at least one nucleic acid molecule according to claim 6; and

(b) at least one nucleic acid molecule derived from and specific for a gene encoding a transferase or a gene encoding an enzyme for the transport or processing of a polysaccharide or oligosaccharide unit, the gene being involved in the synthesis of a particular *E. coli* O antigen.